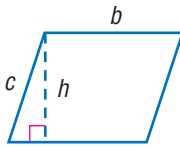
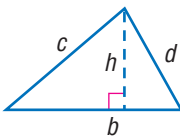
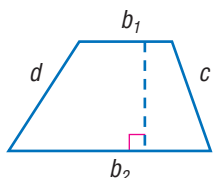


7 Perimeter and Area of Parallelograms, Triangles, and Trapezoids

Several formulas for perimeter are shown in the table.

Shape	Formula	Model
Parallelogram	$P = 2(b) + 2(c)$	
Triangle	$P = b + c + d$	
Trapezoid	$P = b_1 + b_2 + c + d$	

EXAMPLE Find Perimeter of a Triangle

- 1 Find the perimeter of the triangle.

The length of the base is 30 meters. The length of the two sides are 24 and 16 meters.

Estimate $P = 20 + 20 + 30$ or 70 m

$$P = b + c + d$$

Perimeter of a triangle

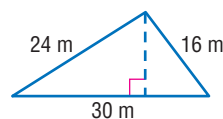
$$P = 30 + 24 + 16$$

Replace b with 30, c with 24, and d with 16.

$$P = 30 + 24 + 16 \text{ or } 70$$

Simplify.

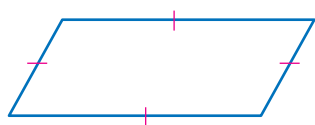
The perimeter of the triangle is 70 meters. Compare to the estimate.



Exercises

Measure the sides of each figure to the nearest $\frac{1}{16}$ inch. Then find the perimeter.

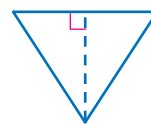
1.



2.



3.



Measure the sides of each figure to the nearest millimeter. Then find the perimeter.

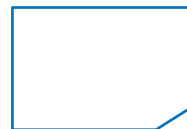
4.



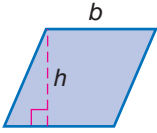
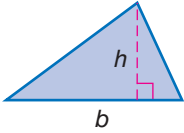
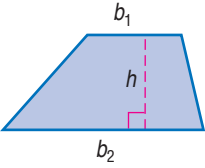
5.



6.



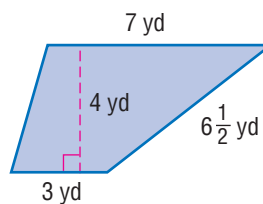
Area formulas are shown in the table below.

Shape	Formula	Model
Parallelogram	$A = bh$	
Triangle	$A = \frac{1}{2}bh$	
Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$	

EXAMPLE Find the Area of a Trapezoid

2 Find the area of the trapezoid.

The height is 4 yards. The lengths of the bases are 7 yards and 3 yards.



$$A = \frac{1}{2}h(b_1 + b_2) \quad \text{Area of a trapezoid}$$

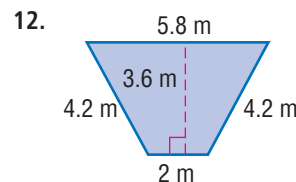
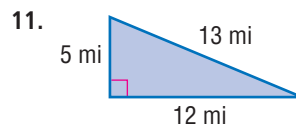
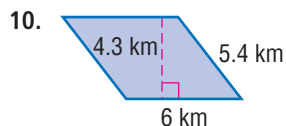
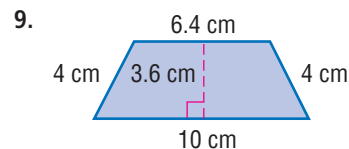
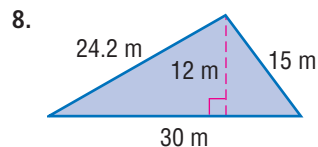
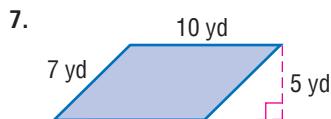
$$A = \frac{1}{2}(4)(7 + 3) \quad \text{Replace } h \text{ with 4, } b_1 \text{ with 7, and } b_2 \text{ with 3.}$$

$$A = \frac{1}{2}(4)(10) \text{ or } 20 \quad \text{Simplify.}$$

The area is 20 square yards.

Exercises

Find the area of each figure.



13. Compare the formulas for the perimeter and area of parallelograms, triangles, and trapezoids.